We Claim

~~1. An equilibrium dialysis apparatus comprising:~~

a body, comprising a top surface having a first plane and a bottom surface having a second plane, in which body is contained at least one testing well, each of which well is separated into a first side and a second side, by means for vertically separating the well, such that both of said sides of each well are fully open and accessible from the top of the body.

2. The apparatus of claim 1, wherein said means for vertically separating the well include ~~dialysis membranes.~~

3. The apparatus of claim 1, wherein said second plane is parallel to said first plane.

4. The apparatus of claim 1, wherein each said membrane separates each said well on a plane perpendicular to said first plane.

5. The apparatus of claim 1, wherein said body comprises a gap separating each said well into a first volume corresponding to said first side, and a second volume corresponding to said second side, and wherein said membrane, when inserted in said gap, comprises a depth and width sufficient to pass from the top of each said well through the entire depth and width of each said well.

~~6. The apparatus of claim 1, wherein said body of the device comprises the material PTFE.~~

7. The apparatus of claim 1, wherein each said well comprises a drilled cavity in the body.

8. The apparatus of claim 1, wherein said body comprises ninety-six wells arranged in an 8x12 array.

9. The apparatus of claim 8, wherein said array comprises spacing and dimensions compatible with standard 96-well format laboratory supplies and instruments.

10. The apparatus of claim 1, wherein said body comprises at least two bars, with adjacent bars separated by a planar gap perpendicular to said first plane and in which gap said dialysis membrane is inserted, and means for holding said bars together.

11. The apparatus of claim 10, wherein said wells comprise a first side and a second side, separated by said planar gap.

12. The apparatus of claim 11, wherein said sides comprise equal volumes.

13. The apparatus of claim 11, wherein said body comprises nine bars containing 96 wells arranged in an 8x12 array of such spacing and dimensions as to be compatible with standard 96-well format laboratory supplies and instruments.

14. The apparatus of claim 10 wherein said means comprise a clamp.

15. The apparatus of claim 10 wherein said means comprise at least one pin extending through the bars and on which all such bars can move relative to one another on a horizontal plane.

16. The apparatus of claim 10 wherein said means comprise at least one rail on which all such bars can move relative to one another on a horizontal plane.

17. The apparatus of claim 15, wherein said means further comprise two alignment pins, of a length sufficient for all bars to rest on such pins, each of which is inserted through a hole formed through both sides of each bar added.

18. A method of conducting equilibrium dialysis assays comprising the steps of: providing a donating side of a well; providing a receiving side of a well; placing a dialysis membrane between said donating side and said receiving side; filling said donating side and said receiving side with a substance to be tested and a dialysis buffer and allowing for dialysis; and providing a

cross-sectional surface contact area formed between said membrane and said substance which is either a rectangle, a rectangle with a semi-circular end, or a rectangle with a triangular end.

19. A method as defined in claim 18, further comprising the step of agitating said wells.

20. A method as defined in claim 18, further comprising the step of altering the temperature of said wells.

21. A method as defined in claim 18, further comprising performing at least 21 assays simultaneously using a single equilibrium dialysis apparatus.

22. A method as described in claim 18, wherein the time required for setting up the device, collecting the test results, and cleaning the device between consecutive tests is less than 4 hours.

23. A method of constructing an equilibrium dialysis apparatus comprising the steps of: providing a body for the apparatus, said body comprising a top surface having a first plane and a bottom surface having a second plane parallel to said first plane; forming at least one well into said body; and inserting a dialysis membrane through each said well so as to separate each said well into a first side and a second side, both of which are accessible at all times from the top of the device.

24. A method as defined in claim 23, wherein each said well is separated by inserting into each said well, a pre-fabricated cell-membrane combination.

25. A method as defined in claim 23, further comprising inserting said membrane through each said well on a plane perpendicular to said first plane.

26. A method as defined in claim 23, further comprising inserting in each said well a dialysis membrane comprising a depth and width sufficient to pass from the top of each said well through the entire depth and width of each said well.

27. A method as defined in claim 23, wherein said forming comprises drilling into said body.

28. A method as defined in claim 27, wherein said forming further comprises drilling 96 wells into said body in an 8x12 array comprising spacing and dimensions compatible with standard 96-well format laboratory supplies and instruments.

29. A method as defined in claim 23, further comprising the step of holding at least two bars together to form the body of the device.

30. A method as defined in claim 29, wherein said holding comprises external clamping.

31. A method as defined in claim 29, wherein said holding comprises placing said bars on at least one alignment pin passing through said bars and on which said bars can move relative to one another on a horizontal plane.

32. A method as defined in claim 29, wherein said holding comprises placing said bars on at least one alignment rail on which the bars can move relative to one another on a horizontal plane.

33. A method as defined in claim 31, wherein said holding comprises placing said bars on two alignment pins, of a length sufficient such that all said bars may rest on said pins when held together, and each of which pins is inserted through a hold formed through both sides of each said bar added .

34. A method as defined in claim 29, wherein said bars are formed by cutting larger blocks.

35. A method as defined in claim 29, wherein said bars are made flat by milling.

36. A method as defined in claim 29, wherein said forming of wells comprises drilling so as to overlap said gap formed between adjacent bars.

37. A method as defined in claim 36, wherein said forming further comprises drilling such that a diameter of each drilled well overlaps said gap formed between adjacent bars.

38. A method as defined in claim 37, wherein said forming further comprises drilling 96 wells in an 8x12 array comprising spacing and dimensions compatible with standard 96-well format laboratory supplies and instruments, such that the eight rows of wells overlap the gaps formed between the nine joined bars.